

### ABSTRACT

A field emitter source and method for making same. An x-ray and a high energy electron source is fabricated from the field emitter. The field emitter source composition comprises carbon black and a mixing medium. An alternative method of field emitter formulation includes providing a quantity of silica with the carbon black and a mixing medium. An x-ray source comprises a substrate and a carbon black field emitter composition provided along a surface of the substrate and an extraction grid to pull electrons from the field emitter film and a metal film biased at high voltage to accelerate the electrons. A conductive film is further provided along an upper support structure of the source, such that when the conductive film is struck by the accelerated electrons, the upper support structure converts the impinging high-energy electrons into x-rays. A high energy electron source is also disclosed similar to the x-ray source but without a conductive film and with appropriate apertures to facilitate egress of the high energy electrons.